SUBSTITUTE SEQUENCE LISTING

<110> The Regants of the University of Michigan

<120> Geraniol Synthase, Method of Production and Uses Thereof

<130> 2115-002692

<140> 10/582549
<141> 2006-06-09

<150> PCT.US2004/040321
<151> 2004-12-02

<160> 4

<170> PatentIn version 3.5

<210> 1
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<212> DNA
<213> Ocimum basilicum

<300>
<301> Iijima,Y., Gang,D.R., Lewinsohn,E. and Pichersky,E.
<302> Characterization of geraniol synthase from the peltate glands of sweet basil
<303> Plant Physiol.
<304> 134
<305> 1
<306> 370-379
<307> 2004
<308> AY362553
<309> 2004-08-05
<313> (1)..(1704)

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Arg Phe Ser Ala Cys Thr Pro Leu Ala Ser Ala Met Pro Leu Ser Ser
        35                  40                  45

Thr Pro Leu Ile Asn Gly Asp Asn Ser Gln Arg Lys Asn Thr Arg Gln
    50                  55                  60

His Met Glu Glu Ser Ser Ser Lys Arg Arg Glu Tyr Leu Leu Glu Glu
65                  70                  75                  80

Thr Thr Arg Lys Leu Gln Arg Asn Asp Thr Glu Ser Val Glu Lys Leu
                85                  90                  95

Lys Leu Ile Asp Asn Ile Gln Gln Leu Gly Ile Gly Tyr Tyr Phe Glu
            100                 105                 110

Asp Ala Ile Asn Ala Val Leu Arg Ser Pro Phe Ser Thr Gly Glu Glu
        115                 120                 125

Asp Leu Phe Thr Ala Ala Leu Arg Phe Arg Leu Leu Arg His Asn Gly
    130                 135                 140

Ile Glu Ile Ser Pro Glu Ile Phe Leu Lys Phe Lys Asp Glu Arg Gly
145                 150                 155                 160

Lys Phe Asp Glu Ser Asp Thr Leu Gly Leu Leu Ser Leu Tyr Glu Ala
                165                 170                 175

Ser Asn Leu Gly Val Ala Gly Glu Glu Ile Leu Glu Glu Ala Met Glu
            180                 185                 190

Phe Ala Glu Ala Arg Leu Arg Arg Ser Leu Ser Glu Pro Ala Ala Pro
        195                 200                 205

Leu His Gly Glu Val Ala Gln Ala Leu Asp Val Pro Arg His Leu Arg
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Met Ala Arg Leu Glu Ala Arg Arg Phe Ile Glu Gln Tyr Gly Lys Gln
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Ser Asp His Asp Gly Asp Leu Leu Glu Leu Ala Ile Leu Asp Tyr Asn
                245                 250                 255

Gln Val Gln Ala Gln His Gln Ser Glu Leu Thr Glu Ile Ile Arg Trp
            260                 265                 270

Trp Lys Glu Leu Gly Leu Val Asp Lys Leu Ser Phe Gly Arg Asp Arg
        275                 280                 285

Pro Leu Glu Cys Phe Leu Trp Thr Val Gly Leu Leu Pro Glu Pro Lys
    290                 295                 300

Tyr Ser Ser Val Arg Ile Glu Leu Ala Lys Ala Ile Ser Ile Leu Leu
305                 310                 315                 320

Val Ile Asp Asp Ile Phe Asp Thr Tyr Gly Glu Met Asp Asp Leu Ile
                325                 330                 335

Leu Phe Thr Asp Ala Ile Arg Arg Trp Asp Leu Glu Ala Met Glu Gly
            340                 345                 350

Leu Pro Glu Tyr Met Lys Ile Cys Tyr Met Ala Leu Tyr Asn Thr Thr
        355                 360                 365

Asn Glu Val Cys Tyr Lys Val Leu Arg Asp Thr Gly Arg Ile Val Leu
    370                 375                 380

Leu Asn Leu Lys Ser Thr Trp Ile Asp Met Ile Glu Gly Phe Met Glu
385                 390                 395                 400

Glu Ala Lys Trp Phe Asn Gly Gly Ser Ala Pro Lys Leu Glu Glu Tyr
                405                 410                 415

Ile Glu Asn Gly Val Ser Thr Ala Gly Ala Tyr Met Ala Phe Ala His
            420                 425                 430

Ile Phe Phe Leu Ile Gly Glu Gly Val Thr His Gln Asn Ser Gln Leu
        435                 440                 445

Phe Thr Gln Lys Pro Tyr Pro Lys Val Phe Ser Ala Ala Gly Arg Ile
    450                 455                 460

Leu Arg Leu Trp Asp Asp Leu Gly Thr Ala Lys Glu Glu Gln Glu Arg
465                 470                 475                 480
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Gly Asp Leu Ala Ser Cys Val Gln Leu Phe Met Lys Glu Lys Ser Leu
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Thr Glu Glu Glu Ala Arg Ser Arg Ile Leu Glu Glu Ile Lys Gly Leu
            500                 505                 510

Trp Arg Asp Leu Asn Gly Glu Leu Val Tyr Asn Lys Asn Leu Pro Leu
        515                 520                 525

Ser Ile Ile Lys Val Ala Leu Asn Met Ala Arg Ala Ser Gln Val Val
    530                 535                 540

Tyr Lys His Asp Gln Asp Thr Tyr Phe Ser Ser Val Asp Asn Tyr Val
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Asp Ala Leu Phe Phe Thr Gln
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Phe His Asn Asn Leu Phe Ser Val Ile Ser Lys Arg His Arg Phe Ser
            20                  25                  30

Thr Thr Ile Thr Thr Arg Gly Gly Arg Trp Ala His Cys Ser Leu Gln
        35                  40                  45

Met Gly Asn Glu Ile Gln Thr Gly Arg Arg Thr Gly Gly Tyr Gln Pro
    50                  55                  60

Thr Leu Trp Asp Phe Ser Thr Ile Gln Leu Phe Asp Ser Glu Tyr Lys
65                  70                  75                  80

Glu Glu Lys His Leu Met Arg Ala Ala Gly Met Ile Ala Gln Val Asn
                85                  90                  95

Met Leu Leu Gln Glu Glu Val Asp Ser Ile Gln Arg Leu Glu Leu Ile
            100                 105                 110

Asp Asp Leu Arg Arg Leu Gly Ile Ser Cys His Phe Asp Arg Glu Ile
        115                 120                 125

Val Glu Ile Leu Asn Ser Lys Tyr Tyr Thr Asn Asn Glu Ile Asp Glu
```

```
    130                 135                 140

Ser Asp Leu Tyr Ser Thr Ala Leu Arg Phe Lys Leu Leu Arg Gln Tyr
145                 150                 155                 160

Asp Phe Ser Val Ser Gln Glu Val Phe Asp Cys Phe Lys Asn Asp Lys
                165                 170                 175

Gly Thr Asp Phe Lys Pro Ser Leu Val Asp Asp Thr Arg Gly Leu Leu
            180                 185                 190

Gln Leu Tyr Glu Ala Ser Phe Leu Ser Ala Gln Gly Glu Glu Thr Leu
        195                 200                 205

His Leu Ala Arg Asp Phe Ala Thr Lys Phe Leu His Lys Arg Val Leu
    210                 215                 220

Val Asp Lys Asp Ile Asn Leu Leu Ser Ser Ile Glu Arg Ala Leu Glu
225                 230                 235                 240

Leu Pro Thr His Trp Arg Val Gln Met Pro Asn Ala Arg Ser Phe Ile
                245                 250                 255

Asp Ala Tyr Lys Arg Arg Pro Asp Met Asn Pro Thr Val Leu Glu Leu
            260                 265                 270

Ala Lys Leu Asp Phe Asn Met Val Gln Ala Gln Phe Gln Gln Glu Leu
        275                 280                 285

Lys Glu Ala Ser Arg Trp Trp Asn Ser Thr Gly Leu Val His Glu Leu
    290                 295                 300

Pro Phe Val Arg Asp Arg Ile Val Glu Cys Tyr Tyr Trp Thr Thr Gly
305                 310                 315                 320

Val Val Glu Arg Arg Glu His Gly Tyr Glu Arg Ile Met Leu Thr Lys
                325                 330                 335

Ile Asn Ala Leu Val Thr Thr Ile Asp Asp Val Phe Asp Ile Tyr Gly
            340                 345                 350

Thr Leu Glu Glu Leu Gln Leu Phe Thr Thr Ala Ile Gln Arg Trp Asp
        355                 360                 365

Ile Glu Ser Met Lys Gln Leu Pro Pro Tyr Met Gln Ile Cys Tyr Leu
    370                 375                 380

Ala Leu Phe Asn Phe Val Asn Glu Met Ala Tyr Asp Thr Leu Arg Asp
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385 390 395 400

Lys Gly Phe Asn Ser Thr Pro Tyr Leu Arg Lys Ala Trp Val Asp Leu
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Val Glu Ser Tyr Leu Ile Glu Ala Lys Trp Tyr Tyr Met Gly His Lys
420 425 430

Pro Ser Leu Glu Glu Tyr Met Lys Asn Ser Trp Ile Ser Ile Gly Gly
435 440 445

Ile Pro Ile Leu Ser His Leu Phe Phe Arg Leu Thr Asp Ser Ile Glu
450 455 460

Glu Glu Asp Ala Glu Ser Met His Lys Tyr His Asp Ile Val Arg Ala
465 470 475 480

Ser Cys Thr Ile Leu Arg Leu Ala Asp Asp Met Gly Thr Ser Leu Asp
485 490 495

Glu Val Glu Arg Gly Asp Val Pro Lys Ser Val Gln Cys Tyr Met Asn
500 505 510

Glu Lys Asn Ala Ser Glu Glu Glu Ala Arg Glu His Val Arg Ser Leu
515 520 525

Ile Asp Gln Thr Trp Lys Met Met Asn Lys Glu Met Met Thr Ser Ser
530 535 540

Phe Ser Lys Tyr Phe Val Gln Val Ser Ala Asn Leu Ala Arg Met Ala
545 550 555 560

Gln Trp Ile Tyr Gln His Glu Ser Asp Gly Phe Gly Met Gln His Ser
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Leu Val Asn Lys Met Leu Arg Gly Leu Leu Phe Asp Arg Tyr Glu
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Asn Leu Thr Thr Cys Leu Gln Pro Ser His Phe Lys Ser Ser Pro Lys
20 25 30

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Leu Leu Ser Ser Thr Asn Ser Ser Ser Arg Ser Arg Leu Arg Val Tyr
        35                  40                  45

Cys Ser Ser Ser Gln Leu Thr Thr Glu Arg Arg Ser Gly Asn Tyr Asn
    50                  55                  60

Pro Ser Arg Trp Asp Val Asn Phe Ile Gln Ser Leu Leu Ser Asp Tyr
65                  70                  75                  80

Lys Glu Asp Lys His Val Ile Arg Ala Ser Glu Leu Val Thr Leu Val
                85                  90                  95

Lys Met Glu Leu Glu Lys Glu Thr Asp Gln Ile Arg Gln Leu Glu Leu
            100                 105                 110

Ile Asp Asp Leu Gln Arg Met Gly Leu Ser Asp His Phe Gln Asn Glu
        115                 120                 125

Phe Lys Glu Ile Leu Ser Ser Ile Tyr Leu Asp His His Tyr Tyr Lys
    130                 135                 140

Asn Pro Phe Pro Lys Glu Glu Arg Asp Leu Tyr Ser Thr Ser Leu Ala
145                 150                 155                 160

Phe Arg Leu Leu Arg Glu His Gly Phe Gln Val Ala Gln Glu Val Phe
                165                 170                 175

Asp Ser Phe Lys Asn Glu Glu Gly Glu Phe Lys Glu Ser Leu Ser Asp
            180                 185                 190

Asp Thr Arg Gly Leu Leu Gln Leu Tyr Glu Ala Ser Phe Leu Leu Thr
        195                 200                 205

Glu Gly Glu Thr Thr Leu Glu Ser Ala Arg Glu Phe Ala Thr Lys Phe
    210                 215                 220

Leu Glu Glu Lys Val Asn Glu Gly Gly Val Asp Gly Asp Leu Leu Thr
225                 230                 235                 240

Arg Ile Ala Tyr Ser Leu Asp Ile Pro Leu His Trp Arg Ile Lys Arg
                245                 250                 255

Pro Asn Ala Pro Val Trp Ile Glu Trp Tyr Arg Lys Arg Pro Asp Met
            260                 265                 270

Asn Pro Val Val Leu Glu Leu Ala Ile Leu Asp Leu Asn Ile Val Gln
        275                 280                 285
```

```
Ala Gln Phe Gln Glu Glu Leu Lys Glu Ser Phe Arg Trp Trp Arg Asn
    290                 295                 300

Thr Gly Phe Val Glu Lys Leu Pro Phe Ala Arg Asp Arg Leu Val Glu
305                 310                 315                 320

Cys Tyr Phe Trp Asn Thr Gly Ile Ile Glu Pro Arg Gln His Ala Ser
                325                 330                 335

Ala Arg Ile Met Met Gly Lys Val Asn Ala Leu Ile Thr Val Ile Asp
            340                 345                 350

Asp Ile Tyr Asp Val Tyr Gly Thr Leu Glu Glu Leu Glu Gln Phe Thr
        355                 360                 365

Asp Leu Ile Arg Arg Trp Asp Ile Asn Ser Ile Asp Gln Leu Pro Asp
    370                 375                 380

Tyr Met Gln Leu Cys Phe Leu Ala Leu Asn Asn Phe Val Asp Asp Thr
385                 390                 395                 400

Ser Tyr Asp Val Met Lys Glu Lys Gly Val Asn Val Ile Pro Tyr Leu
                405                 410                 415

Arg Gln Ser Trp Val Asp Leu Ala Asp Lys Tyr Met Val Glu Ala Arg
            420                 425                 430

Trp Phe Tyr Gly Gly His Lys Pro Ser Leu Glu Glu Tyr Leu Glu Asn
        435                 440                 445

Ser Trp Gln Ser Ile Ser Gly Pro Cys Met Leu Thr His Ile Phe Phe
    450                 455                 460

Arg Val Thr Asp Ser Phe Thr Lys Glu Thr Val Asp Ser Leu Tyr Lys
465                 470                 475                 480

Tyr His Asp Leu Val Arg Trp Ser Ser Phe Val Leu Arg Leu Ala Asp
                485                 490                 495

Asp Leu Gly Thr Ser Val Glu Glu Val Ser Arg Gly Asp Val Pro Lys
            500                 505                 510

Ser Leu Gln Cys Tyr Met Ser Asp Tyr Asn Ala Ser Glu Ala Glu Ala
        515                 520                 525

Arg Lys His Val Lys Trp Leu Ile Ala Glu Val Trp Lys Lys Met Asn
    530                 535                 540
```

```
Ala Glu Arg Val Ser Lys Asp Ser Pro Phe Gly Lys Asp Phe Ile Gly
545                 550                 555                 560

Cys Ala Val Asp Leu Gly Arg Met Ala Gln Leu Met Tyr His Asn Gly
                565                 570                 575

Asp Gly His Gly Thr Gln His Pro Ile Ile His Gln Gln Met Thr Arg
            580                 585                 590

Thr Leu Phe Glu Pro Phe Ala
        595
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